

IN THE CLAIMS

A copy of the claims is enclosed below for the Examiner's convenience.

1. (Previously Presented) A method of packaging comprising:
applying an adhesive to a first side of a finished wafer, the first side of the finished wafer having at least one die, the adhesive being one or more of an elastomer applied in fluid form, a thermoplastic material, or a pressure-sensitive film; and
forming an array of conductive elements within the adhesive, the array of conductive elements electrically coupled to an array of connection pads on the at least one die.
2. (Original) The method of claim 1, wherein forming an array of conductive elements includes:
creating openings in the adhesive, the openings aligned with the array of connection pads;
and
substantially filling the openings with an electrically conductive material.
3. (Original) The method of claim 1, wherein the method is performed in the order presented.
4. (Previously Presented) A method of packaging comprising:
applying an adhesive to a first side of a finished wafer, the first side of the finished wafer having at least one die, the adhesive being an elastomer applied in fluid form;
processing the adhesive to create an array of openings therein, the array of openings providing access to an array of connection pads on the at least one die; and
substantially filling the array of openings with an electrically conductive material.
5. (Original) The method of claim 4, wherein the method further includes applying a protective coating to a second side of the wafer.

6. (Original) The method of claim 4, wherein the method further includes singulating the at least one die from the wafer wherein the at least one die with the adhesive and electrically conductive material form an individual flip chip package.
7. (Original) The method of claim 6, wherein the method further includes surface mounting the flip chip package to a receiving support.
8. (Original) The method of claim 4, wherein the method further includes curing the adhesive.
9. (Original) The method of claim 4, wherein the method is performed in the order presented.
10. (Withdrawn) A method of packaging comprising:
applying an adhesive to a first side of a finished wafer, the first side comprising an array of dice;
processing the adhesive to create an array of openings therein, the array of openings providing access to an array of connection pads on each die of the array of dice;
substantially filling the array of openings with an electrically conductive material; and
singulating each die from the array of dice, wherein each die, combined with the adhesive and electrically conductive material, forms an individual flip chip package.
11. (Withdrawn) The method of claim 10, wherein the method is performed in the order presented.
12. (Withdrawn) The method of claim 10, wherein substantially filling the array of openings includes placing at least one solder ball therein.

13. (Withdrawn) The method of claim 10, wherein substantially filling the array of openings includes forming a solder column therein.
14. (Withdrawn) The method of claim 10, wherein substantially filling the array of openings includes dispensing a conductive paste therein.
15. (Withdrawn) The method of claim 10, wherein the method is performed in the order presented.
16. (Withdrawn) A method of packaging comprising:
 - attaching a second side of a first die to a first side of a second die, the first side of the second die located on a first side of a finished wafer, such that a first array of connection pads located on a first side of the first die is adjacent to a second array of electrical connection pads located on the first side of the second die;
 - applying an adhesive layer over the first side of the first die and the first side of the second die; and
 - forming an array of conductive elements within the adhesive layer, the array of conductive elements electrically coupled to the first array of connection pads and/or the second array of connection pads.
17. (Withdrawn) The method of claim 16, wherein applying an adhesive layer includes distributing a fluid material over the first side of the first die and the first side of the second die, the fluid material forming a hardenable layer.
18. (Withdrawn) The method of claim 16, wherein the method further includes electrically interconnecting at least one connection pad of the first array of connection pads to at least one connection pad of the second array of connection pads prior to applying the adhesive layer.

19. (Withdrawn) The method of claim 16, wherein the method further includes creating an array of openings in the adhesive layer, the array of openings substantially aligned with one or more connection pads of the first array of connection pads and the second array of connection pads.
20. (Withdrawn) The method of claim 19, wherein the method further includes depositing a conductive material into the array of openings.
21. (Withdrawn) The method of claim 16, wherein the method is performed in the order presented.
22. (Withdrawn) A method of packaging comprising:
singulating a first die from a first wafer where the first wafer comprises a plurality of first dice, wherein the first die has a first side and a second side;
attaching the second side of the first die to a first side of a second die, the second die forming a portion of a second wafer where the second wafer is a finished wafer having a plurality of second dice, the second die being larger than the first die;
applying an adhesive to the second wafer, the adhesive substantially covering the first side of both the first die and the second die;
processing the adhesive to create an array of openings therein, the array of openings providing access to an array of connection pads on each of the first die and the second die; and
substantially filling the array of openings with an electrically conductive material.
23. (Withdrawn) The method of claim 22, wherein the method further includes singulating the second die from the second wafer, the singulated second die with the attached first die, the adhesive, and the electrically conductive material forming an individual multi-chip, flip chip package.

24. (Withdrawn) The method of claim 22, wherein the method further applying a protective coating to a second side of the second wafer.
25. (Withdrawn) The method of claim 22, wherein the method further applying a bonding material to the second side of the first wafer, the bonding material adapted to permit attaching of the first die to the second die.
26. (Withdrawn) The method of claim 22, wherein the method is performed in the order presented.
27. (Previously Presented) A method of packaging comprising:
forming an array of conductive elements within an adhesive layer; and
applying the adhesive layer to a first side of a finished wafer, the first side of the finished wafer having one or more dice, after forming the array of conductive elements to couple the array of conductive elements electrically to an array of connection pads on a first die of the one or more dice.
28. (Original) The method of claim 27, wherein forming an array of conductive elements within an adhesive layer includes forming openings in the adhesive layer.
29. (Original) The method of claim 28, wherein forming openings in the adhesive layer includes forming openings by laser cutting, chemical etching, or die cutting.
30. (Original) The method of claim 27, wherein forming an array of conductive elements includes forming an array of solder columns.
31. (Original) The method of claim 27, wherein forming an array of conductive elements includes forming an array of solder balls.

32. (Original) The method of claim 27, wherein applying the adhesive layer includes applying the adhesive layer configured as a film.

33. (Original) The method of claim 27, wherein the method further includes singulating the first die from the finished wafer and forming an individual flip chip package.

34. (Previously Presented) A method of packaging comprising:

coupling an array of conductive elements electrically to an array of connection pads on a first die of a finished wafer, the finished wafer having one or more dice, each die having an active side on a first side of the finished wafer; and

applying an adhesive layer to the first side of the finished wafer after coupling the array of conductive elements to the array of connection pads to form the array of conductive elements within the adhesive layer.

35. (Original) The method of claim 34, wherein forming an array of conductive elements includes forming an array of solder columns.

36. (Original) The method of claim 34, wherein forming an array of conductive elements includes forming an array of solder balls.

37. (Original) The method of claim 34, wherein applying the adhesive layer includes applying the adhesive layer configured as a film with preformed openings.

38. (Original) The method of claim 37, wherein applying the adhesive layer configured as a film with preformed openings includes applying a film with openings formed by laser cutting, chemical etching, or die cutting.

39. (Original) The method of claim 34, wherein the method further includes singulating the first die from the finished wafer and forming an individual flip chip package.

40. (Previously Presented) A method of packaging comprising:
- providing a finished wafer having one or more dice, each die having an active side with an array of connection pads, the active side disposed on a first side of the finished wafer;
 - applying a protective coating to a backside of the finished wafer, the backside being opposite the first side of the finished wafer;
 - applying an adhesive layer to the first side of the finished wafer, the adhesive layer substantially covering the active side of a first die of the one or more dice of the finished wafer, the adhesive layer being a thermoplastic material;
 - processing the adhesive layer to create an array of openings therein, the array of openings providing access to the array of connection pads of the first die of the finished wafer; and
 - substantially filling the array of openings with an electrically conductive material to electrically contact the array of connection pads; and
 - singulating the first die from the finished wafer.
41. (Previously Presented) The method of claim 40, wherein applying an adhesive layer includes applying a thermoplastic material having a transition temperature such that the thermoplastic material does not soften during subsequent processing.
42. (Previously Presented) The method of claim 40, wherein substantially filling the array of openings with an electrically conductive material includes forming conductive column-shaped structures.
43. (Original) The method of claim 40, wherein applying a protective coating to a backside of the finished wafer includes applying an epoxy.
44. (Original) The method of claim 40, wherein processing the adhesive layer to create an array of openings includes:
- masking areas of the adhesive layer, wherein the adhesive layer is a photo-sensitive adhesive layer;

exposing the photo-sensitive adhesive layer to an energy source; and
etching the photo-sensitive adhesive layer to form the array of openings.

45. (Original) The method of claim 40, wherein substantially filling the array of openings with an electrically conductive material includes placing a solder ball in each opening of the array of openings.

46. (Withdrawn) A method of packaging comprising:

providing a first die, the first die having an active side and a back side, the active side having a first array of connection pads;

providing a finished wafer having one or more dice, each die having an active side with an array of connection pads, the active side disposed on a first side of the finished wafer;

securing the first die to a second die on the finished wafer, the second die being one of the one or more dice of the finished wafer, such that the first array of connection pads located on the active side of the first die is accessible and a second array of electrical connection pads located on the active side of the second die is accessible;

interconnecting one or more connections pads of the first array of connection pads with one or more connections pads of the second array of connection pads;

applying an adhesive layer to the first side of the finished wafer, the adhesive layer substantially covering the active side of both the first die and the second die;

processing the adhesive layer to create an array of openings therein, the array of openings providing access to the first array of connection pads and/or to the second array of connection pads;

substantially filling the array of openings with an electrically conductive material to electrically contact the first array of connection pads and/or to the second array of connection pads; and

singulating the second die from the finished wafer with the first die secured to the second die.

47. (Withdrawn) The method of claim 46, wherein providing a first die includes:
providing a first wafer having one or more dice, the first wafer having an active side and a back side;
producing a bonding layer on the back side of the first wafer;
dicing the first wafer to provide the first die with a bonding layer on its back side.
48. (Withdrawn) The method of claim 47, wherein securing the first die to a second die on the finished wafer includes attaching the back side of the first die to the active side of the second die by the bonding layer.
49. (Withdrawn) The method of claim 48, wherein attaching the back side of the first die to the active side of the second die by the bonding layer includes using a pressure-sensitive material as the bonding layer to attach the back side of the first die to the active side of the second die.
50. (Withdrawn) The method of claim 48, wherein attaching the back side of the first die to the active side of the second die by the bonding layer includes using a heat-sensitive pressure-sensitive material as the bonding layer to bond the back side of the first die to the active side of the second die.
51. (Withdrawn) The method of claim 46, wherein applying an adhesive layer includes applying a fluid.
52. (Withdrawn) The method of claim 46, wherein the method further includes curing the adhesive layer.
53. (Withdrawn) The method of claim 46, wherein the method further includes applying a protective coating to a backside of the finished wafer.

54. (Withdrawn) The method of claim 46, wherein processing the adhesive layer to create an array of openings includes:

masking areas of the adhesive layer, wherein the adhesive layer is a photo-sensitive adhesive layer;

exposing the photo-sensitive adhesive layer to an energy source; and

etching the photo-sensitive adhesive layer to form the array of openings.

55. (Withdrawn) The method of claim 46, wherein substantially filling the array of openings with an electrically conductive material includes placing a solder ball in each opening of the array of openings.

56. (Withdrawn) The method of claim 46, wherein substantially filling the array of openings with an electrically conductive material includes placing a conductive paste or conductive gel in each opening of the array of openings forming an array of solder columns.

57. (Withdrawn) The method of claim 46, wherein the method further includes:

securing a plurality of first die to a plurality of second die;

dicing the finished wafer for a plurality of individual multi-chip packages.

58. (Withdrawn) The method of claim 57, wherein the method further includes dicing the finished wafer for a plurality of individual multi-chip packages having more than two die.